Conventional Question

1. Separate each of the following algebraic expressions into terms, write down like terms in the appropriate boxes and simplify the algebraic expression.

(a) $4x^2 + 5x^3 - 6x + 8x - 2x + 7x^2 + 6 - 3x^3 + 14$

Term x^3	Term x^2	Term x	Constant term

(b) $6x^2y - 8xy + 4 - 5x^2y + 7x^2 - 4xy - 11x^2 - 45$

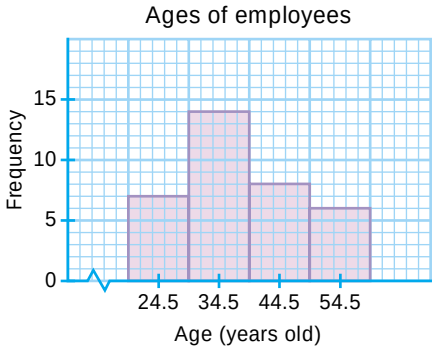
Term x^2y	Term x^2	Term xy	Constant term

2. The length and the width of a rectangle are 30 cm and 20 cm respectively. Find the ratio of its length to its perimeter.

3. **(a)** Mark the points $P(2, 5)$, $Q(2, -5)$, $R(-2, -5)$ and $S(-2, 5)$ on a rectangular coordinate plane.
(b) Join PQ, PR, RS and SQ.
(c) Which line segments are parallel to each other?
(d) Write down the coordinates of the point of intersection of PR and QS.

4. **(a)** Draw the graph of the equation $x - 2y = 4$ from $x = -2$ to $x = 3$ on a rectangular coordinate plane.
(b) If $P(1, p)$ lies on the graph, find the value of p.

5. The following histogram shows the ages of employees in a company. It is known that the first class interval is 20 - 29 years old.

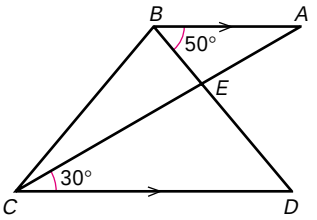


(a) Which class interval has the lowest frequency?
(b) How many employees are there in this company?
(c) What percentage of employees are below 39.5 years old?

6. In the figure, AEC and BED are straight lines, $BA // CD$.

(a) Find $\angle BEC$.

(b) If $BC = BD$, find $\angle EBC$.



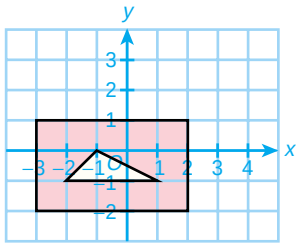
7. It is given that $4x + 5y - 20 = 0$.

(a) Find the coordinates at which the graph of the equation cuts the x-axis.

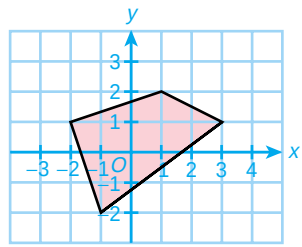
(b) Find the coordinates at which the graph of the equation cuts the y-axis.

8. Find the shaded area of each of the following figures.

(a)

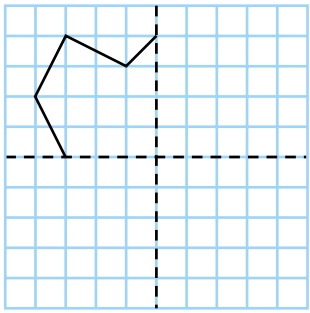


(b)

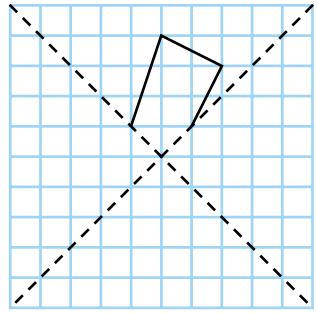


9. Each of the following is a part of a reflectional symmetrical figure. Copy them on a graph paper and complete them by taking the dotted lines as the axes of symmetry.

(a)

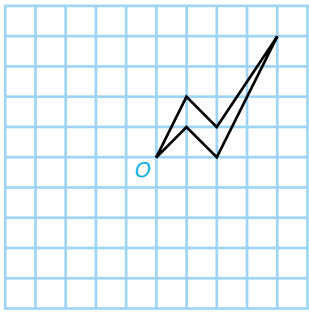


(b)



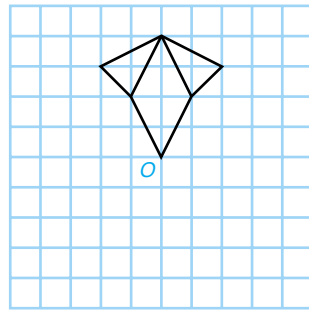
10. Each of the following is a part of a rotational symmetrical figure with the number of fold of rotational symmetry given in brackets. Copy them on a graph paper and complete them by taking O as the centre of rotation.

(a)



[2]

(b)



[4]

11. If 5 US dollars (USD) can be exchanged for 39 Hong Kong dollars (HKD), and 6 euro (EUR) can be exchanged for 63 HKD.

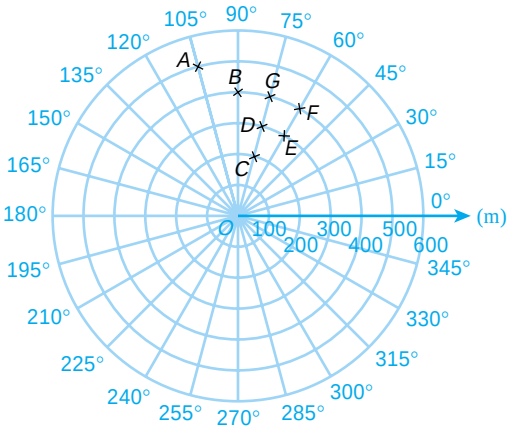
(a) How much HKD can be exchanged for 60 USD?

(b) How much HKD can be exchanged for 60 EUR?

(c) Between the exchange rates from USD to HKD and from EUR to HKD, which exchange rate is higher?

12. Suppose a can of $25xy^2$ g milk powder costs $\$200x^3y^3$, a can of $5x^2$ g coffee powder costs $\$35x^4y$ and a pack of x^2y^2 pieces of cube sugar costs $\$x^3y^3$. If 20 g of milk powder, 30 g of coffee powder and 3 pieces of cube sugar are required to make a cup of coffee, find the cost of a cup of coffee.

13. The locations of a group of *dolphins* (*A*, *B*, *C*, *D*, *E*, *F*, *G*) traced by a *marine research ship* (*O*) are shown in the given polar coordinate plane.



(a) Write down the polar coordinates of the locations of these dolphins.

(b) Which dolphin is the farthest from the ship? Which one is the nearest?

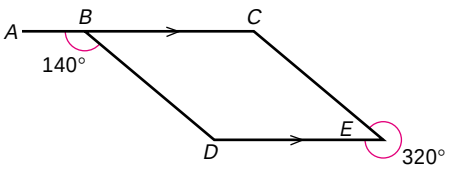
(c) Dolphin *P* left the group and the ship finds that it is at (600, 255°). Plot the location of dolphin *P* on the figure and find its distance from the nearest dolphin of the group.

(d) Find $\angle AOP$.

14. In the figure, *ABC* is a straight line, $AC \parallel DE$.

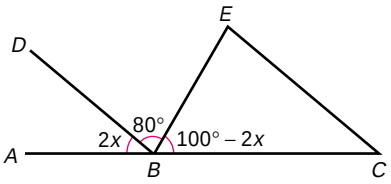
(a) Find $\angle BDE$.

(b) Prove that $BD \parallel CE$.



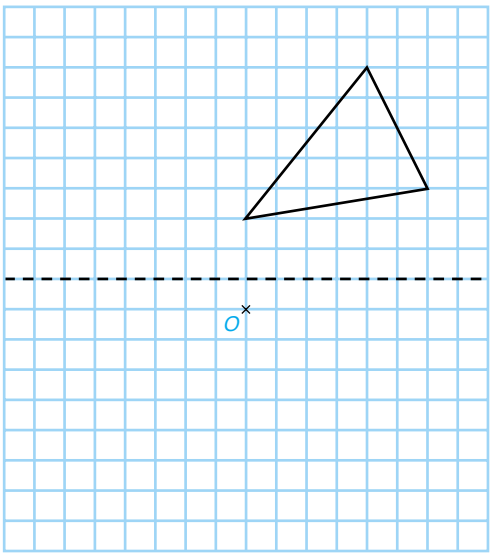
15. **(a)** Prove that *ABC* is a straight line.

(b) If $BD \parallel CE$ and $\angle ECB = 40°$, find *x*.



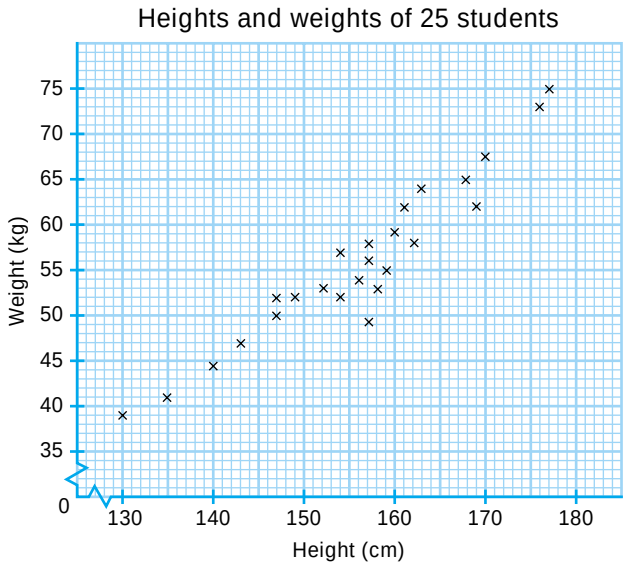
dolphin 海豚　　marine research ship 海洋研究艦

16. Copy the figure on the graph paper and draw the image of the figure after each of the following transformations.



(a) Translate 9 units downwards and 1 unit to the right.
(b) Rotate about point *O* clockwise through 90°.
(c) Reflect along the dotted line.

17. The following scatter diagram shows the heights and weights of 25 students.



(a) Describe the relation between the heights and weights of this group of students.

(b) According to the above scatter diagram, complete the following tables.

Height (cm)	Frequency
130 - 139	
140 - 149	
150 - 159	
160 - 169	
170 - 179	

Weight (kg)	Frequency
35 - 43	
44 - 52	
53 - 61	
62 - 70	
71 - 79	

(c) Construct a frequency distribution table of weights of this group of students with class boundaries and class marks.

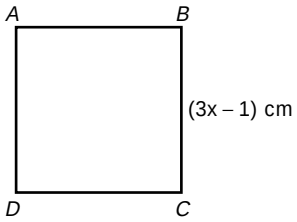
(d) Based on the frequency distribution table in **(c)**, construct a histogram.

18. \$5 397 is shared among Suki, Gary and Ben. The amounts Suki and Gary get are in the ratio of 2 : 1 and Ben gets 4 times as much as Gary.

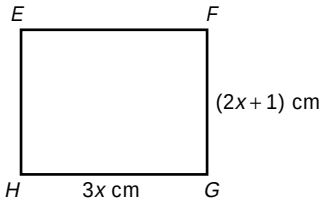
(a) Find the ratio of the amounts Suki, Gary and Ben get.

(b) Find the amount each of them gets.

19. **(a)** Find the perimeter of square *ABCD* in terms of *x*.



(b) Find the area of rectangle *EFGH* in terms of *x*.



(c) If the perimeters of *ABCD* and *EFGH* are equal, find the value of *x*.

(d) If the area of *ABCD* is larger than that of *EFGH*, find the difference in area between *ABCD* and *EFGH*.

20. Some biscuits are shared by 3 people equally and each of them gets x biscuits with 2 left. However, if those biscuits are shared by 4 people equally, each of them gets y biscuits with 1 left.

(a) Set up an equation in x and y.

(b) It is given that x is a positive integer smaller than 10. Draw a suitable straight line on the rectangular coordinate plane and find all the possible values of x and y.

21. The following table shows a survey on the public opinions about bus fare.

Opinion	Frequency
Expensive	225
Moderate	175
Cheap	25
No comment	75

(a) Which types of statistical graphs are suitable to present the above data?

(b) **(i)** Among the statistical graphs in **(a)**, which one can highlight the opinion expressing 'Expensive'?

(ii) Hence present the above data with the graph in **(b)(i)**.

(c) **(i)** Among the statistical graphs in **(a)**, which one can show the percentage of each kind of opinion?

(ii) Hence present the above data with the graph in **(c)(i)**.

MC Question

22. Which of the following polynomials is arranged in ascending power of y?

A. $2y-3y^2+5$

B. $1-y+2y^2$

C. $6y^2-5y+1$

D. y^2-5y^3+9

23. Which of the following statements is/are true?

I. $5x^2$, $\frac{1}{2}x^2$ and $3x^2$ are like terms.

II. $\frac{6x^3y}{x}$ and $2x^2y$ are unlike terms.

III. The degree of $3x(2x^2-x^2y-y^2)$ is 3.

A. **I** only

B. **I** and **III** only

C. **II** and **III** only

D. **I**, **II** and **III**

24. Which of the following pairs of points have a different distance from the others?

A. $E(2, 6)$ and $F(7, 6)$

B. $K(1, 4)$ and $L(-4, 4)$

C. $M(0, 2)$ and $N(0, 7)$

D. $P(-3, 9)$ and $Q(-3, 6)$

25. There are 40 students in S1A. Among them, 25 are boys. What is the ratio of the number of boys to that of girls?

A. 5 : 3

B. 4 : 2

C. 3 : 5

D. 2 : 4

26. 30 km/h : 20 m/s =

A. 1 : 4.

B. 3 : 2.

C. 4 : 1.

D. 5 : 12.

moderate 適中

27. The following table shows the marks of 35 students in an examination.

Marks	Frequency
31 - 40	5
41 - 50	6
51 - 60	9
61 - 70	12
71 - 80	3

Which of the following statements is/are true?

I. The class width of each group is 9 marks.

II. The class mark of the third class interval is 55 marks.

III. The class boundary of the fourth class interval is 60.5 marks - 70.5 marks.

A. **III** only
B. **I** and **II** only
C. **I** and **III** only
D. **II** and **III** only

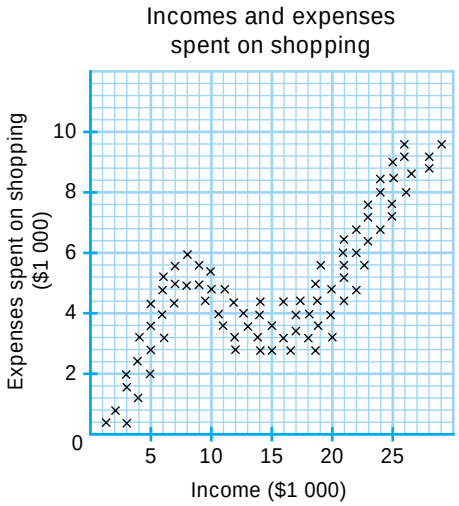
28. Which of the following ordered pairs does not satisfy the equation $y = 2x + 5$?

A. (1, 7)
B. (2, 9)
C. (4, 13)
D. (5, 17)

29. If $P(2, k)$ is a point of the graph of $y = -2x + 3$, find the value of k.

A. –7
B. –1
C. 0.5
D. 7

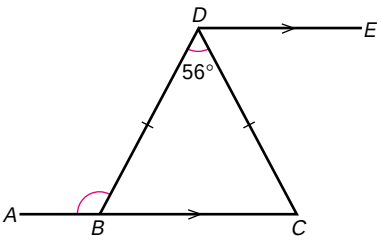
30. The following scatter diagram shows the incomes of a group of ladies and their expenses spent on shopping.



Which group of ladies has a negative relation between their incomes and expenses spent on shopping?

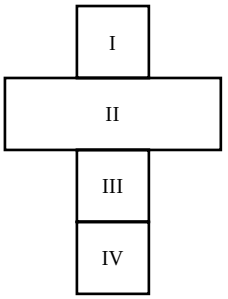
A. Ladies with incomes lower than $7 000
B. Ladies with incomes between $7 000 and $12 000
C. Ladies with incomes between $12 000 and $17 000
D. Ladies with incomes higher than $17 000

31. In the figure, ABC is a straight line, $BD = CD$, $DE \parallel AC$. $\angle ABD =$



A. 112°.
B. 118°.
C. 120°.
D. 124°.

32. The following figure is formed by four parts **I**, **II**, **III** and **IV**. Which part should be removed to give a maximum number of axes of symmetry?



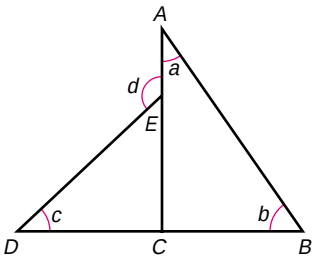
A. **I**
B. **II**
C. **III**
D. **IV**

33. Which of the following statements is/are true?

I. A figure can have both reflectional symmetry and rotational symmetry.
II. Reflection changes the shape of a figure.
III. A 2-fold rotational symmetrical figure must be reflectional symmetrical.

A. **I** only
B. **II** only
C. **I** and **III** only
D. **I**, **II** and **III**

34. In the figure, *AEC* and *BCD* are straight lines. Which of the following must be true?



A. $c + d = 180°$
B. $d = a + b + c$
C. $a + b + c + d = 180°$
D. $a + b + c + d = 360°$

35. After which of the following transformations will the original figure overlap its image?

A. Reflect along the x-axis and then reflect along the y-axis.
B. Rotate about the origin clockwise through 90°, then through 180° and finally anti-clockwise through 90°.
C. Rotate about the origin clockwise through 90°, then through 180° and finally clockwise through 90°.
D. Reflect along the x-axis and then rotate about the origin through 180°.